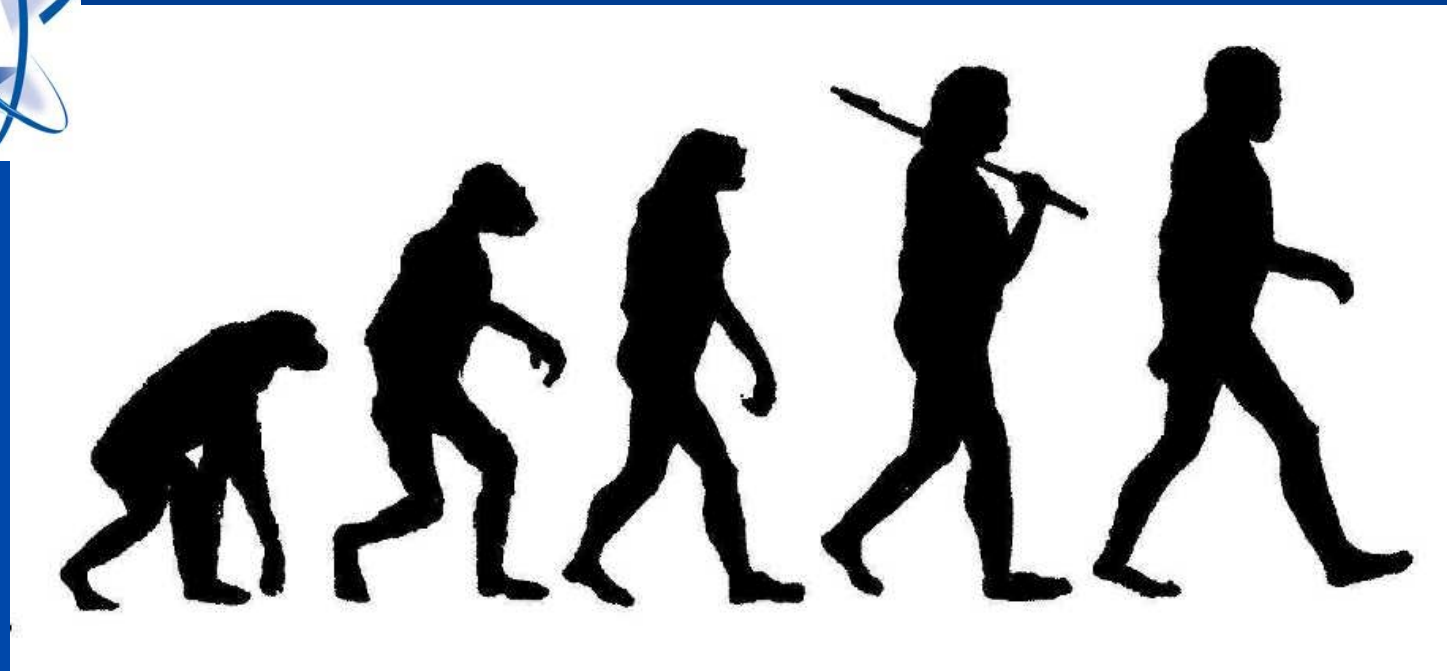


# Handheld and Mobile UV Curing Systems

## Design & Safety Considerations

David Snyder  
American Ultraviolet Company

# UV Curing is an Evolving Technology



1970s

1980s

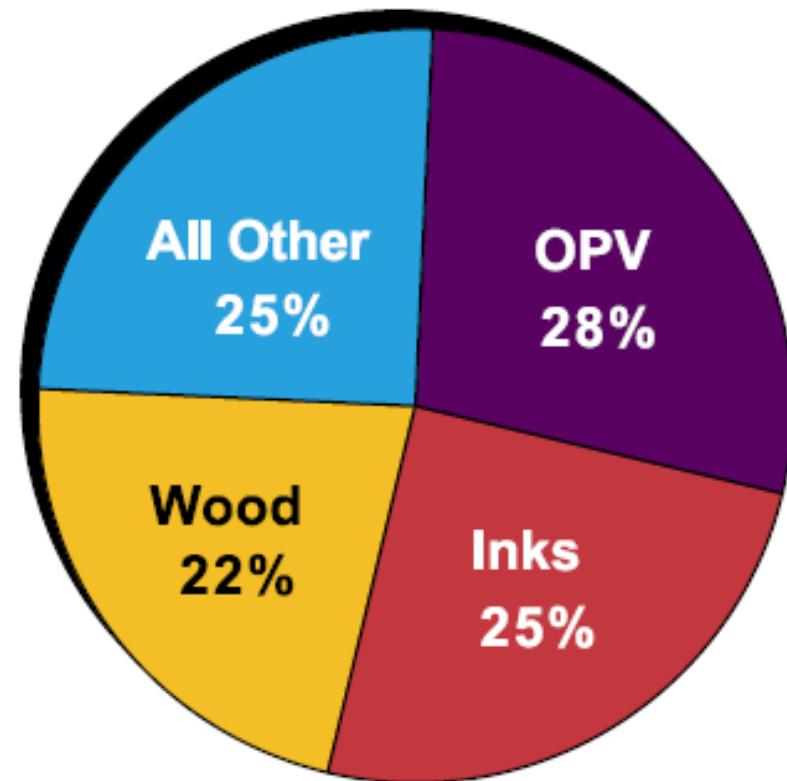
1990s

2000s

2010s

# The Evolution of UV

UV has traditionally been used to cure factory-applied inks, coatings and adhesives



# The Evolution of UV

Using high-speed processes for high-volume production



# The Evolution of UV

- Factory cured substrates include:
  - Paper
  - Wood
  - Plastics
  - Metal
  - Others



# The Evolution of UV

Only recently has  
UV moved from  
the factory-  
  
to the field

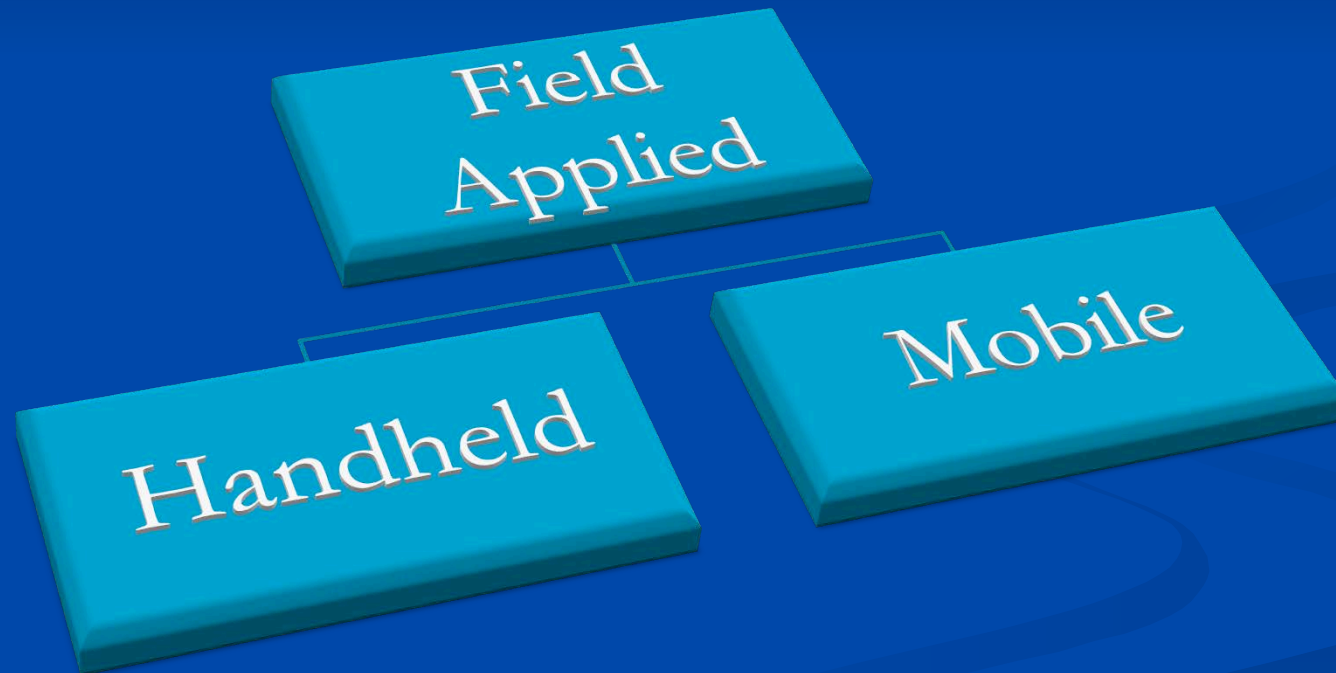




# Field Applied Markets

- Hardwood flooring
- VCT (vinyl composite tiles)
- Cabinets
- Concrete floors
- Concrete countertops
- Marble, Granite, Terrazzo, etc
- Headlight lens and auto body repair
- Bathtub refinishing
- Many other applications

# Field-Applied UV Curing Systems

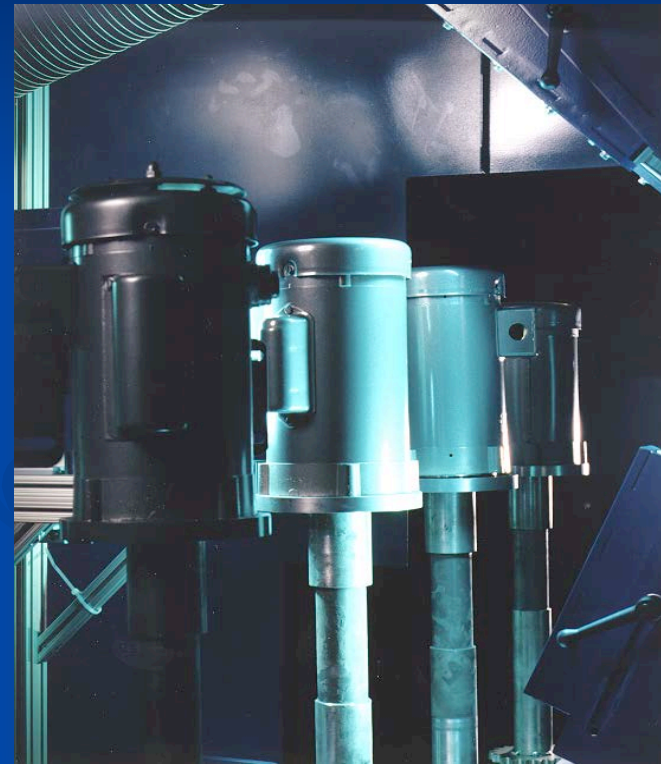




# Comparing UV Curing System Needs

## Factory Applied

- High Production
- Optimized
- Upstream & Downstream integration
- Complex controls
- Shielding, Safety Interlocks
- Cooling blowers
- Power Cabinets



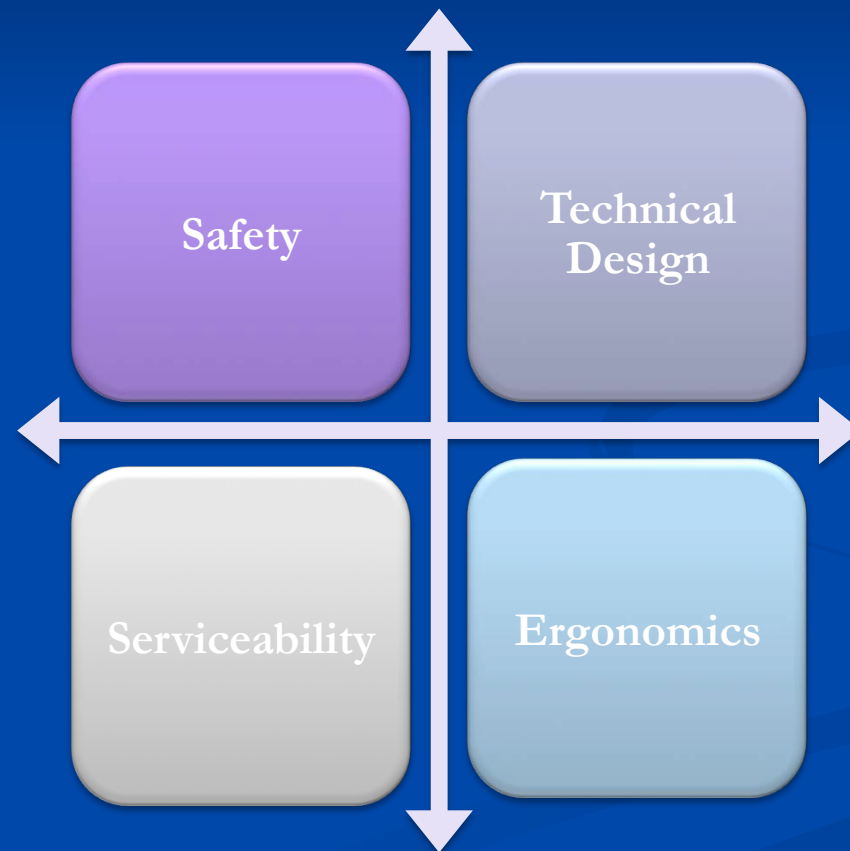
# Comparing UV Curing System Needs

## Field Applied

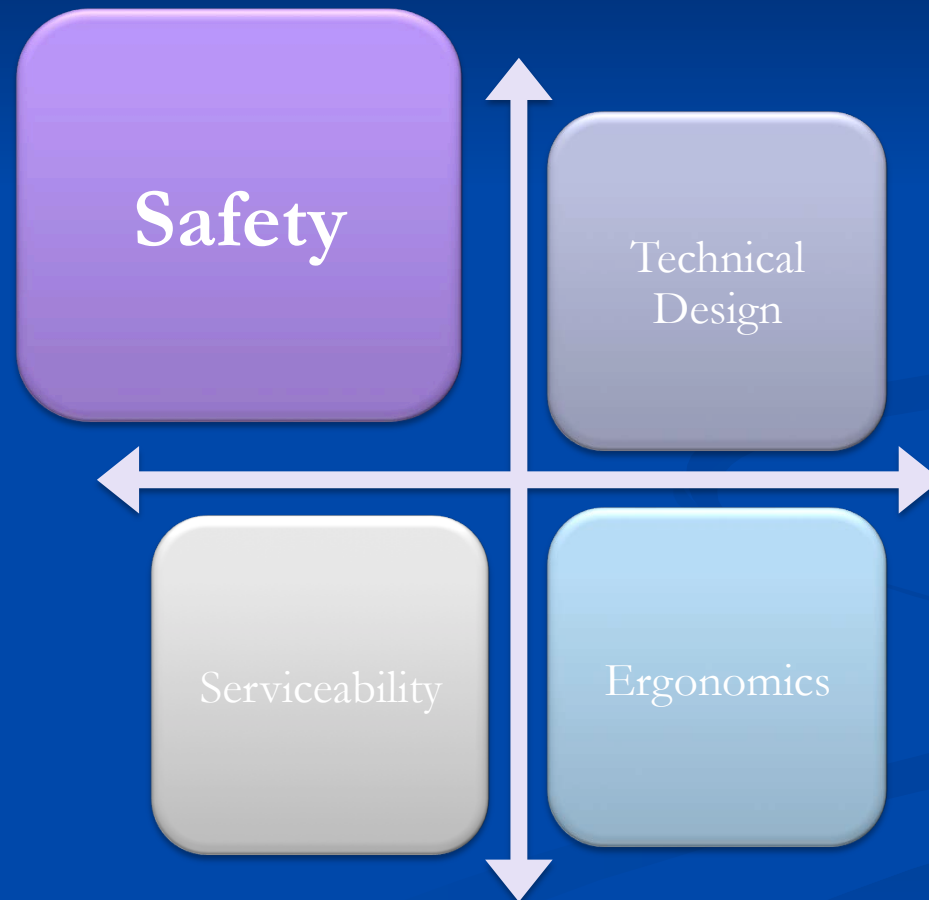
- One-at-a-time
- Flexible
- UV cure is an isolated process
- Simple controls
- Ergonomic designs
- Safety features
- Self-contained cooling



# Design Criteria Elements



# Design Criteria Elements



# UV Health & Safety

- UV light, particularly short wave UV, poses a serious health threat if not properly handled



# UV Health & Safety

In field applications, UV light poses a serious health threat if not properly handled

Workers should protect their eyes and skin from exposure to high intensity, short-wave UV exposure.

This worker is wearing gloves, skin covering, UV face shield for protection

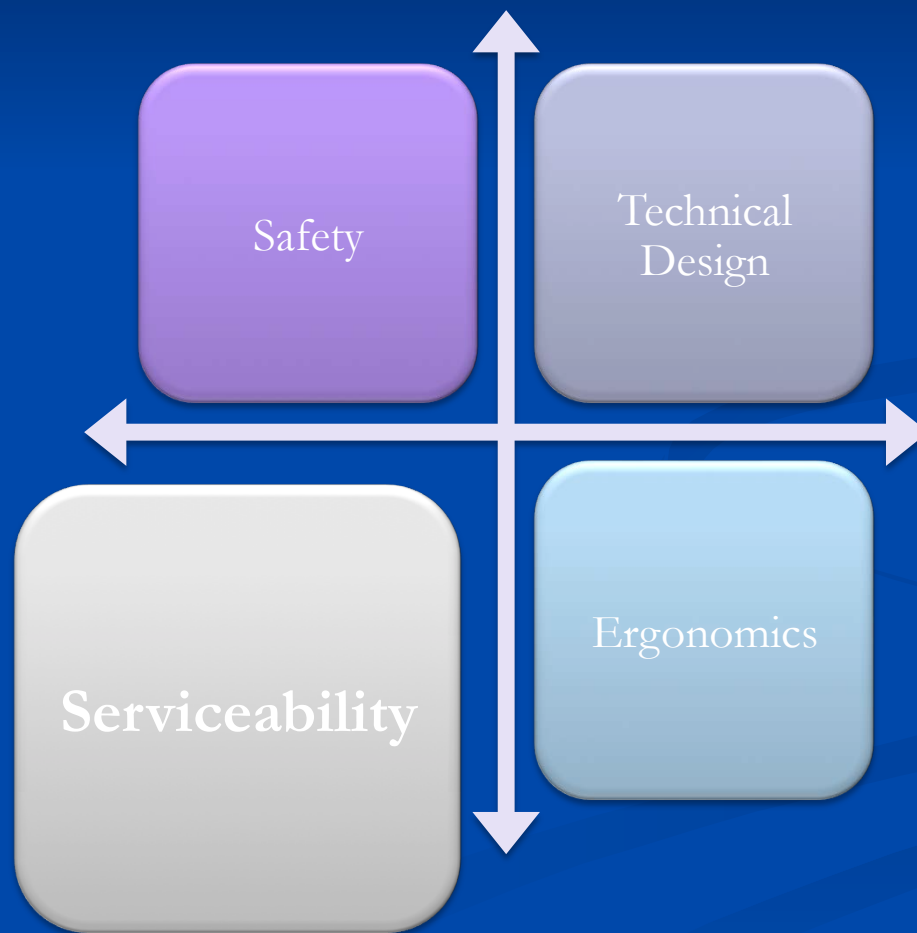


# Safety

- UV equipment systems are designed to be safe for the operator and others
  - Shielding, interlocks, E-stops
  - Shutter mechanisms
  - Proximity sensors
  - Robust design for heat dissipation
  - Ozone free UV lamps
  - Simple 110V operation in handheld units
- Training – very important
- Operators must work safely
  - Eye shields, skin protection, etc.
- Exercise good housekeeping when handling chemistry, cleanup



# Design Criteria Elements



# Easy Field Serviceability

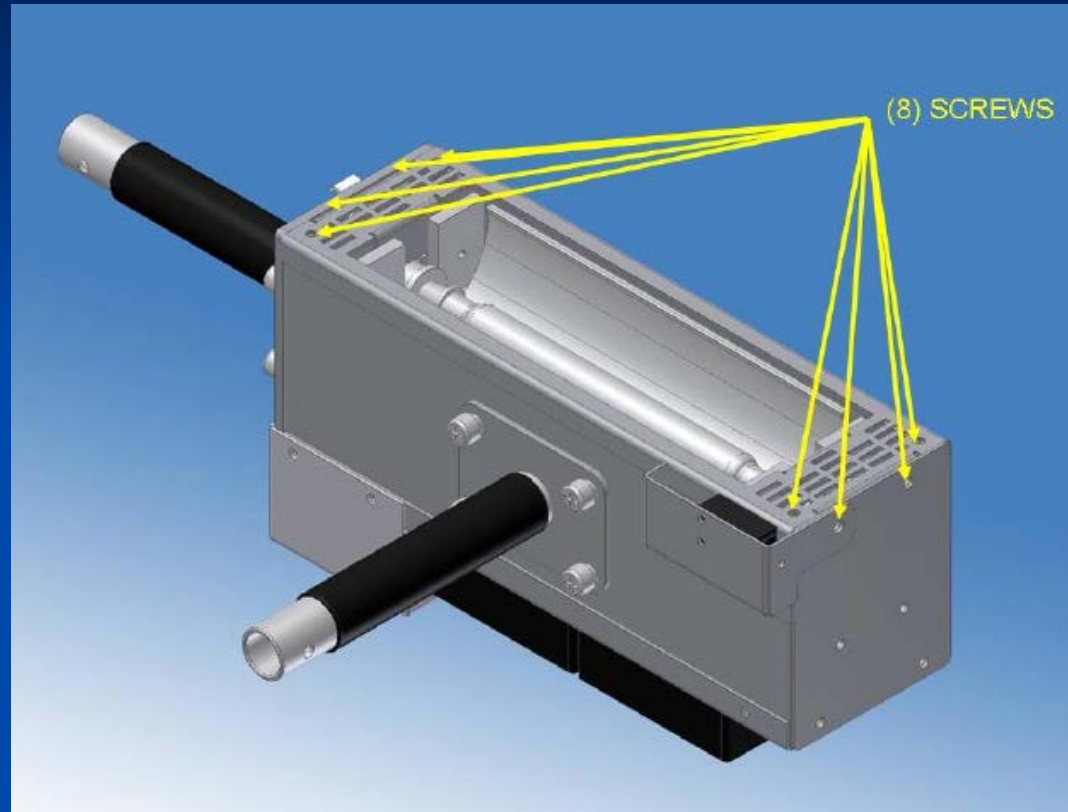
- Systems designed for field use must be easy to service-
  - with simple tools
  - by relatively non-technical personnel
  - quick lamp and reflector liner changes



# Serviceability

Equipment designed for Field Applied UV Curing must be simple and straightforward to service and maintain.

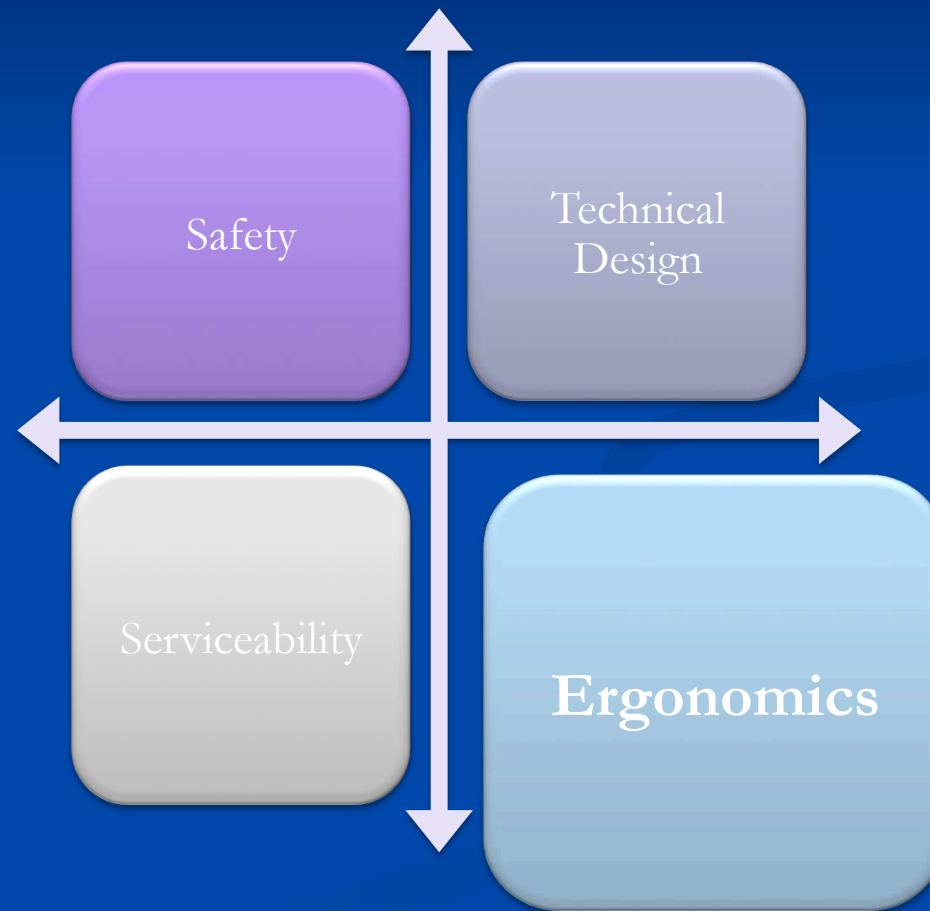
Here, a lamp is easily changed by removing a few standard screws.



# Serviceability

- Designed for common tools
- Easy access to replacement, wear parts
- Well documented training manuals
- Technical support

# Design Criteria Elements



# Handheld UV module

Close up of a small  
hand held unit

Two hand grips make  
using the unit very easy

Emergency stop button  
located on top of the  
handheld unit





# Portable Handheld UV Curing Units

- Multi-functional handheld unit
- Ideal for corners, stairs, countertops, etc.
- Shuttered UV lamp provides instantaneous operation
- Laser Proximity Sensor for safety-prevents unwanted exposure
- Move out of range; unit closes shutters and drops to standby low power level.
- Robust, all-in-one design with telescoping handle for safe and easy transport





# Self propelled and manual operated floor units

Used to cure coatings for selected applications or entire floor areas

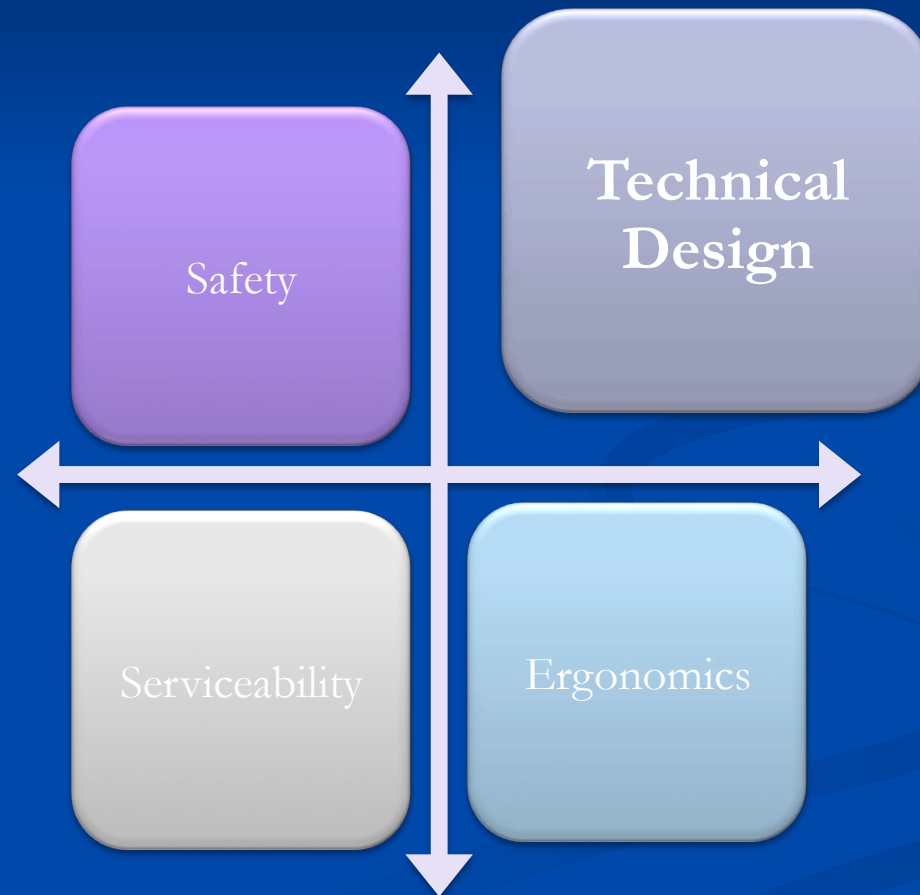
Use in conjunction with handheld units



# Ergonomics

- Correct balance of weight
- Comfort, well located handle(s)
- Easy reach of controls, especially when gloved
- Touch screen controls

# Design Criteria Elements



# Technical Design Considerations

## Includes:

- Safety
- Ergonomics
- Serviceability
- Operator Ease of Use
- Equipment Costs

## Requirements:

- Lamp intensity levels
- Power requirements
- Lamp /reflector changing & cleaning
- Reflector geometry
- Portability
- Shutters
- Controls – ease of use
- Reliability



# Thank You!

David Snyder

American Ultraviolet

[dsnyder@auvco.com](mailto:dsnyder@auvco.com)